

CLAIMS

What is claimed is:

- 5           1.       An apparatus for distributed control of an electrical appliance having a plug and a load  
and two power carrying conductors connecting said plug to said load, comprising:  
                    power control elements that are completely contained within said plug;  
                    interface elements that are connected to said two power carrying conductors  
and that are not contained within said plug; and  
10                      means for transmitting status information from said interface elements to said  
power control elements by imposition of electrical signals onto said two power carrying conductors,  
wherein said electrical signals comprise an adjustable duration deadzone at a zero crossing of a  
sinusoidal excitation.
- 15           2.       The apparatus of claim 1 wherein said status information includes items selected from  
the group consisting of switch state, temperature, light, sound, vibration, and presence of an electrical  
fault.
3.       The apparatus of claim 1 wherein said power control elements are controlled in  
20   response to said status information.
4.       The apparatus of claim 1 wherein said power control elements comprise one or more  
members selected from the group consisting of thyristors and transistors.
- 25           5.       The apparatus of claim 1 wherein said interface elements are resident in a module that  
is located between said plug and said load.

6. The apparatus of claim 1 wherein said interface elements are located adjacent to said load.

7. The apparatus of claim 1 wherein said power control elements can interrupt power to  
5 said load.

8. The apparatus of claim 1 wherein said interface elements comprise one or more of the group consisting of switches, push buttons, potentiometers, and light emitting devices.

10 9. The apparatus of claim 1 wherein said load is selected from the group consisting of incandescent lights, electric blankets, heating pads, electric irons, fans, and aquarium heaters.

10. The apparatus of claim 1 wherein if said status information indicates presence of an electrical fault, power is interrupted by means of said power control elements.

15 11. A network appliance control apparatus having a power cord and a plug and comprising power control elements that are completely contained within said plug, wherein said power control elements are controlled to impose electrical signals onto the prongs of the plug.

20 12. The apparatus of claim 11 wherein said electrical signals are detectable by monitoring electronics within a receptacle outlet.

13. The apparatus of claim 12 wherein said receptacle outlet is part of a building control network.

25 14. An appliance control apparatus having a power cord and a plug and comprising power monitoring elements and power control elements that are completely contained within said plug wherein said power monitoring elements can detect an external power interruption.

15. The apparatus of claim 14 wherein said power interruption is used to convey control signals to said power control elements.

5 16. The apparatus of claim 14 wherein patterns of power interruptions are used to convey control requests.

17. An appliance control apparatus that is resident in a module insertable into a receptacle outlet and into which an appliance is plugged, said apparatus comprising means for controlling the  
10 appliance and means for transmitting status information to and/or from said appliance by imposition of electrical signals onto two power carrying conductors, wherein said electrical signals comprise an adjustable duration deadzone at a zero crossing of a sinusoidal excitation.

18. The apparatus of claim 17 wherein power control electronics are resident in said  
15 module.

19. The apparatus of claim 18 wherein said power control electronics are responsive to signals imposed upon the power carrying conductors.

20 20. A method for distributed control of an electrical appliance having a plug and a load and two power carrying conductors connecting the plug to the load, the method comprising the steps of:

locating power control elements completely within the plug;

connecting interface elements to the two power carrying conductors, which interface elements are not within the plug; and

25 transmitting status information from the interface elements to the power control elements by imposition of electrical signals onto the two power carrying conductors, wherein the electrical signals comprise an adjustable duration deadzone at a zero crossing of a sinusoidal excitation.

21. The method of claim 20 wherein the status information includes items selected from the group consisting of switch state, temperature, light, sound, vibration, and presence of an electrical fault.

5           22. The method of claim 20 wherein the power control elements are controlled in response to the status information.

23. The method of claim 20 wherein the power control elements comprise one or more members selected from the group consisting of thyristors and transistors.

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24. The method of claim 20 wherein the interface elements are resident in a module that is located between the plug and the load.

25. The method of claim 20 wherein the interface elements are located adjacent to the load.

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26. The method of claim 20 wherein the power control elements can interrupt power to the load.

27. The method of claim 20 wherein the interface elements comprise one or more of the  
20 group consisting of switches, push buttons, potentiometers, and light emitting devices.

28. The method of claim 20 wherein the load is selected from the group consisting of incandescent lights, electric blankets, heating pads, electric irons, fans, and aquarium heaters.

25           29. The method of claim 20 wherein if the status information indicates presence of an electrical fault, power is interrupted by means of the power control elements.

30. A network appliance control method for an appliance having a power cord and a plug, the method comprising the steps of:

locating power control elements completely within the plug; and

controlling the power control elements to impose electrical signals onto the

5 prongs of the plug.

31. The method of claim 30 additionally comprising the step of detecting the electrical signals with monitoring electronics within a receptacle outlet.

10 32. The method of claim 31 wherein the receptacle outlet is part of a building control network.

33. An appliance control method for an appliance having a power cord and a plug, the method comprising the steps of:

15 locating power monitoring elements and power control elements completely within the plug; and

detecting via the power monitoring elements an external power interruption.

20 34. The method of claim 33 additionally comprising the step of using the power interruption to convey control signals to the power control elements.

35. The method of claim 33 wherein patterns of power interruptions are used to convey control requests.

36. An appliance control method employing a module insertable into a receptacle outlet and into which an appliance is plugged, the method comprising the steps of controlling the appliance and transmitting status information to and/or from the appliance by imposition of electrical signals onto two power carrying conductors, wherein the electrical signals comprise an adjustable duration deadzone at a zero crossing of a sinusoidal excitation.

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37. The method of claim 36 wherein power control electronics are resident in the module.

38. The method of claim 37 wherein the power control electronics are responsive to signals imposed upon the power carrying conductors.

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